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SOUTHERN FOREST EXPERIMENT STATION

E. L. Demmon, Director

New Orleans, La.

THE SUPPLY AND STATUS OF NAVAL-STORES TIMBER IN SURVEY UNIT #1 FLORIDA

By

SOUTHERN FOREST SURVEY STAFF

I.F.Eldredge

Regional Survey Director

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* - This is an advance release of Forest Survey data that will be included in complete reports to be published later. This information is subject to correction or amplification as computations proceed.

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IN SURVEY UNIT #1

FLORIDA

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Regional Survey Director

This release presents briefly the most significant naval stores data gathered by the Forest Survey in Unit No. 1 Florida. The land classification and turpentine-crop data, and all data concerning the number, size, and species of trees were computed from basic information taken on 11,956 quarter-acre sample plots. These plots were uniformly taken over the entire unit regardless of ownership by a line-plot survey system in which the plots were taken every 660 feet on parallel compass lines run east and west across the state ten miles apart. The line-plot work was done in the period December 1933 - October 1934.

The data concerning the division of turpentine crops and acreage between owned and leased, and the number, size and character of naval stores operations were gathered independently of the line plot work by a still-to-still canvass of approximately 100 percent of the operations. This canvass was made in the period May to July, 1934.

Land-use classes

This unit, comprising a gross area of approximately 9,778,000 acres located in the northeastern part of Florida is shown in Figure 1. The net area, exclusive of 263,000 acres within the boundaries of the Ocala National Forest, is 9,515,000 acres. The following table shows the classification of this area by kind of land use.

Table 1. - Distribution of land area by class of land use, Survey Unit #1[1], Florida

Land use classes	Area in acres	Percent of total area
Forest	7,378,900	77.5
Nonforest:		
Agricultural:		
In cultivation:		
Old crop land[2]	939,800	9.9
New crop land[3]	11,000	.1
Out of cultivation:		
Idle[4]	315,400	3.3
Abandoned[5]	128,500	1.4
Pasture:		
Improved[6]	48,100	.5
Total agricultural	1,442,800	15.2
Other areas:		
Prairie and grass land	65,400	.7
Marsh	411,600	4.3
Waterways	44,200	.5
Towns and villages	83,600	.9
Roads, railroads, etc.	89,100	.9
Total other areas	693,900	7.3
Total forest and nonforest	9,515,600	100.0

[1]Does not include Ocala National Forest, the gross area of which is 263,000 acres.

[2]Land cultivated at least 5 years and on which a farm crop was raised within 2 years prior to the date of survey.

[3]Land recently converted from forest to crop land. Stumps or standing dead trees are usually present. Dead hardwood trees and stumps usually decay and disappear within 5 years.

[4]Cultivated land that has not produced farm crop for two years or more, but which has not reached the abandoned class.

[5]Land once cultivated but showing distinct evidence of having been abandoned for agricultural crop production; no attempt is being made to keep it as pasture.

[6]Cleared land under fence used primarly for grazing. A real attempt has been made to produce and maintain a sod.

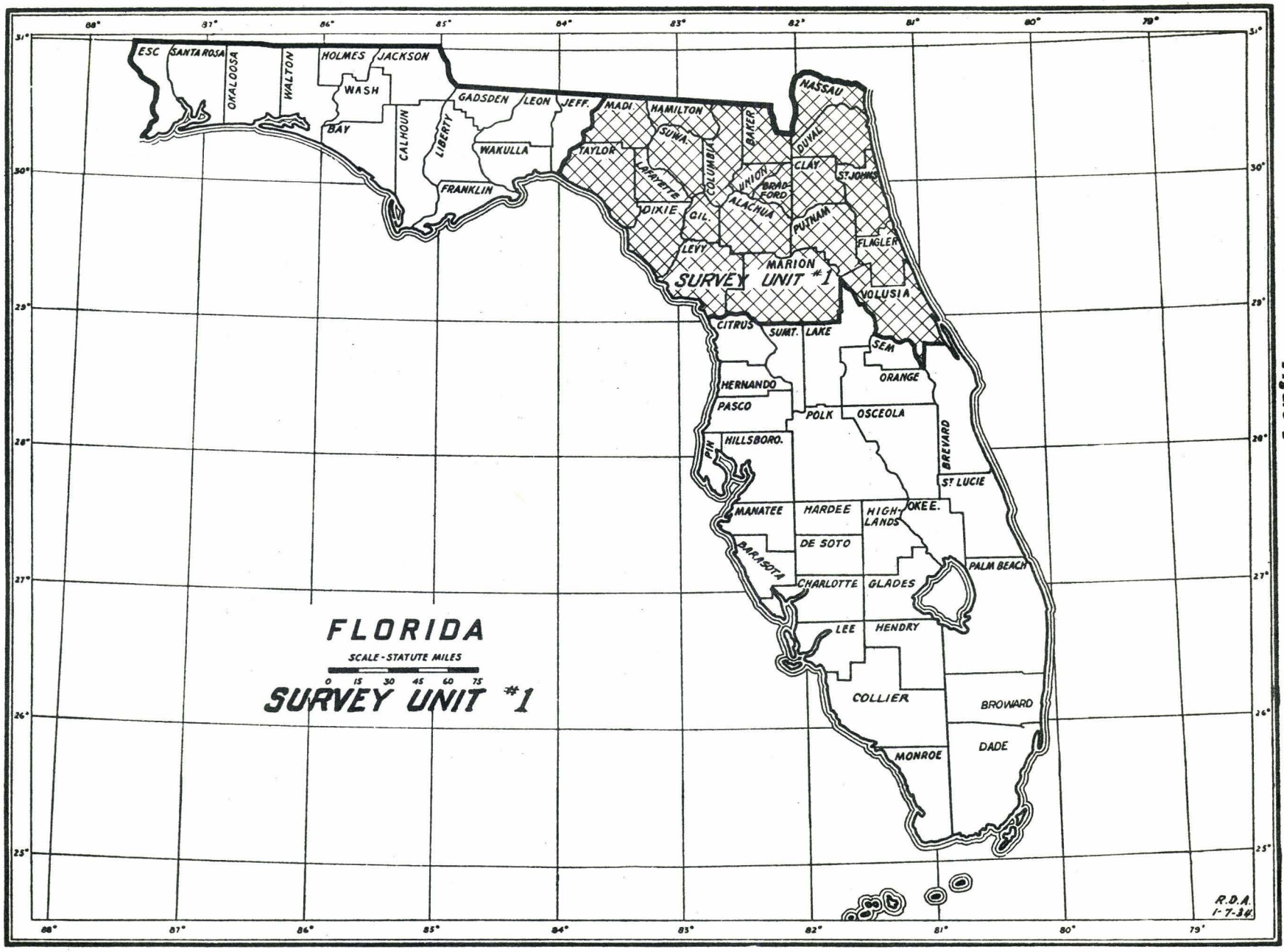

FLORIDA
SCALE - STATUTE MILES
0 15 30 45 60 75
SURVEY UNIT #1
ESC
SANTA ROSA
OKALOOSA
WALTON
HOLMES
JACKSON
WASH
BAY
CALHOUN
LIBERTY
GADSDEN
LEON
JEFF.
WAKULLA
FRANKLIN
MADI.
HAMILTON
SUWA.
TAYLOR
LAFAYETTE
COLUMBIA
BAKER
NASSAU
DUVAL
CLAY
ST. JOHNS
UNION
BRAD-FORD
ALACHUA
DIXIE
GIL.
PUTNAM
FLAGLER
LEVY
MARION
SURVEY UNIT #1
VOLUSIA
CITRUS
SUMT.
LAKE
SEM
ORANGE
HERNANDO
PASCO
POLK
OSCEOLA
PIN
HILLSBORO.
BREVARD
ST LUCIE
MANATEE
HARDEE
HIGH-LANDS
OKEE.
DE SOTO
SARASOTA
PALM BEACH
CHARLOTTE
GLADES
LEE
HENDRY
COLLIER
BROWARD
DADE
MONROE
R.D.A.
1-7-34

Figure 1

Area classified by forest types and turpentine history

In Table 2 the 7,378,900 acres of forest land is allocated to the main forest type groups found in the unit. The table also shows the acreage occupied by trees in the various stages of turpentine working. Definitions of these stages follow:

Round crops - Areas bearing longleaf and slash pine trees upon which no cups have as yet been hung.

Working crops - Areas bearing trees that are now being worked for naval stores.

Idle crops - Areas bearing trees once worked for naval stores but on which operations were discontinued before the turpentine faces on the worked trees reached a height of five feet. These faces may possibley be worked again.

Worked-out crops - Areas bearing trees once worked for naval stores but on which operations were discontinued after the turpentine faces had reached a height of more than five feet. Worked-out crops include both crops in which the trees are resting prior to further working on back faces, and crops in which the trees are completely exhausted for naval stores operation.

Non-turpentine areas - Areas occupied for the most part by non-turpentine species in which there are too few turpentine trees to justify working, or areas of naval stores type which are either cut-over and not restocked or the stands are too immature for consideration.

From Table 2 it appears that naval stores timber is found on almost 70 percent of the forest area in Florida Unit No. 1. A certain percentage of the longleaf and slash pine naval-stores timber is found in the hardwood and non-turpentine pine types.

Table 2. - Forest area by forest type groups and turpentine crop history, Survey Unit #1[1], Florida, season 1934-35

Turpentine crop history	Forest type groups			Total	Percent of total forest area
	Longleaf and slash pine predominating	Loblolly and other nonturpentine pine predominating	Hardwood predominating		
	Acres				
Round	1,754,300	44,100	142,700	1,941,100	26.3
Working	1,282,800	33,100	65,400	1,381,300	18.7
Idle	282,300	9,500	17,300	309,100	4.2
Worked-out and resting	1,453,800	34,700	70,200	1,558,700	21.1
Nonturpentine area	174,200	463,600	1,469,700	2,107,500	28.6
Subtotal	4,947,400	585,000	1,765,300	7,297,700	98.9
Noncommodity[2]				81,200	1.1
Total				7,378,900	100.0
Percent of total forest area	67.1	7.9	23.9		

[1] Does not include the area of the Ocala National Forest.

[2] Forest areas that do not bear commercial timber species; therefore not included in the three major type groups.

Classification of working turpentine area

The total forest area being worked for turpentine is 1,381,300 acres. This area is organized into turpentine crops that are being operated by a large number of naval stores operators. These operations have been divided into seven classes as follows:

Operator - A person who maintains a turpentine still and processes crude gum from his own or leased timber exclusively.

Operator and farmer - An operator who combines farming with turpentining to the extent of at least half his time.

Operator and gum-buyer - An operator who in addition to stilling gum from his own or leased timber, buys crude gum from producers, and, after processing, sells it in his own name.

Operator and custom-stiller - An operator, who in addition to stilling gum from his own or leased timber, processes crude gum for producers who market the turpentine and rosin in their own names.

Operator, gum-buyer, and custom-stiller - An operator who is both a gum-buyer and a custom-stiller.

Gum-producer-seller - A person who does not maintain a still, but who works his own or leased timber for crude gum, which he sells to stillers.

Gum-producer-shipper - A person without a still who works his own or leased timber for crude gum, which is custom-stilled and marketed in his own name.

Table 3 shows the owned and the leased acreage being worked by each class of gum-producer. More than three-fourths of the working naval-stores area is leased.

Table 3. - Turpentine working acreage classified as owned and leased, and by types of operations producing crude gum, Survey Unit #1[1], Florida, season 1934-35

Types of operations	Gross working acreage			Percent of total working acreage
	Owned	Leased	Total	
	---------- Acres ----------			
Operator	293,400	976,500	1,269,900	91.9
Operator and farmer	5,200	10,100	15,300	1.1
Operator and gum-buyer	1,000	2,300	3,300	.2
Operator and custom-stiller	14,200	32,400	46,600	3.4
Operator, gum-buyer, and custom-stiller	4,300	4,300	8,600	.6
Gum-producer-seller	3,900[2]	800[2]	4,700[2]	.4
Gum-producer-shipper	6,900[2]	26,000[2]	32,900[2]	2.4
Total	328,900	1,052,400	1,381,300	100.0
Percent of total working acreage	23.8	76.2	100.0	

[1]Does not include the area of the Ocala National Forest.

[2]Estimated from information furnished by still operators.

Turpentine trees

In Table 4 the longleaf and slash pine trees, regardless of the forest type or turpentine crop in which they are found, are classified according to two-inch diameter classes. The trees are also classified by the extent, if any, to which they have been worked for turpentine. Definitions of these classes follow:

Round trees - Longleaf and slash pine trees that have never been worked for naval stores.

Working trees - Longleaf and slash pine trees that are being worked for naval stores.

Idle trees - Trees that have been worked for naval stores, but for one reason or another are not now being worked, and whose naval-stores productivity has not been exhausted.

Worked-out trees - Trees that have been worked until their usefulness as naval-stores producers has been exhausted.

Table 4. - Number of longleaf and slash pine trees by tree turpentine history and diameter classes, Survey Unit #1[1], Florida, season 1934-35

Tree diameter 4½ feet above ground[2]	Tree turpentine history				Total	Percent of total
	Round	Working	Idle	Worked-out		
Inches	----------Thousands of trees[3]----------					
3.0- 4.9	89,597	-	-	-	89,597	33.1
5.0- 6.9	63,036	neg.	978	79	64,093	23.7
7.0- 8.9	41,352	5,266	5,519	2,381	54,518	20.2
9.0-10.9	15,214	7,033	5,487	3,295	31,029	11.5
11.0-12.9	5,992	5,866	4,005	2,413	18,276	6.7
13.0-14.9	2,703	2,170	1,671	1,451	7,995	2.9
15.0-16.9	1,000	763	568	599	2,930	1.1
17.0-18.9	457	174	205	268	1,104	.4
19.0 and larger	460	129	196	227	1,012	.4
Total	219,811	21,401	18,629	10,713	270,554	100.0
Percent of total	81.2	7.9	6.9	4.0	100.0	

[1] Does not include Ocala National Forest.

[2] For turpentined trees this diameter is calculated from diameters measured at 10 feet above ground.

[3] To obtain the full number of trees add "000".

Table 5. - Working turpentine cups classified by year of working and diameter of working trees, Survey Unit #1 1/, Florida, season 1934-35

Tree diameter 4½ feet above ground 2/	Year of working												Total	
	1st year		2nd year		3rd year		4th year		5th year		6th year and up			
Inches	Number of cups	Percent	Number of cups	Percent	Number of cups	Percent	Number of cups	Percent	Number of cups	Percent	Number of cups	Percent	Number of cups	Percent
Under 7.0 3/	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.0 - 8.9	1,107	23.5	709	17.8	694	25.7	757	21.5	883	25.4	1,120	27.8	5,270	23.5
9.0 - 10.9	1,583	33.6	1,246	31.2	962	35.7	1,135	32.2	1,164	33.5	1,309	32.5	7,399	33.0
11.0 - 12.9	1,205	25.6	1,318	33.1	694	25.7	1,009	28.7	893	25.7	974	24.2	6,093	27.2
13.0 - 14.9	476	10.1	454	11.4	239	8.9	379	10.8	331	9.6	442	11.0	2,321	10.4
15.0 - 16.9	214	4.5	180	4.5	63	2.4	142	4.0	107	3.1	155	3.8	861	3.8
17.0 - 18.9	76	1.6	44	1.1	22	.8	51	1.5	56	1.6	25	.6	274	1.2
19.0 and larger	51	1.1	35	.9	22	.8	47	1.3	38	1.1	6	.1	199	.9
Total	4,712	100.0	3,986	100.0	2,696	100.0	3,520	100.0	3,472	100.0	4,031	100.0	22,417	
Percent	21.0		17.8		12.0		15.7		15.5		18.0			100.0

1/ Does not include Ocala National Forest.
2/ Corrected to remove the influence of turpentining on tree diameter; calculated from diameters measured at 10 feet above ground.
3/ The number of cups on trees under 7.0 inches in diameter is negligible.

TO OBTAIN FULL NUMBER OF CUPS ADD 000

The total number of trees now being worked in the unit is 21,401,000. On these trees there are 22,417,000 cups or an average of 1.05 cups per tree. Table No. 5 classifies these working cups by the diameter of the trees on which they hang and the stage of working of the faces above them.

It is common practise for naval stores operators to lease a considerable part of the timber they work for turpentine. The extent to which this practise is followed differs in different parts of the naval stores belt. The following table shows that in Survey Unit #1, Florida over 77 percent of the cups being worked in the season 1934-35 were in leased timber.

Table 6. - Working turpentine cups classified as owned and leased, and by types of operations producing crude gum, Survey Unit #1[1], Florida, season 1934-35

Types of operations	Working cups			Percent of total working cups
	Owned	Leased	Total	
	---------- Thousands of cups[2] ----------			
Operator	4,568	16,126	20,694	92.3
Operator and farmer	94	180	274	1.2
Operator and gum-buyer	25	55	80	.4
Operator and custom-stiller	152	444	596	2.7
Operator, gum-buyer and custom-stiller	65	67	132	.6
Gum-producer-seller	63[3]	11[3]	74[3]	.3
Gum-producer-shipper	119[3]	448[3]	567[3]	2.5
Total	5,086	17,331	22,417	
Percent of total working cups	22.7	77.3		100.0

[1]Does not include Ocala National Forest.

[2]To convert to full number of cups add "000".

[3]Estimated from information furnished by still operators.

The 4,712,000 first-year cups indicated in Table No. 5 are shown in Table No. 7 classified according to those hung on front-cupped trees and those on back-cupped trees.

Almost two-thirds of the season's virgin cups were hung on trees being worked for the first time. Slightly less than one-fourth were hung on trees under 9 inches in diameter.

Table 7. - First-year turpentine cups on front-cupped and back-cupped trees, Survey Unit #1[1], Florida, Season 1934-35

Tree diameter 4½ feet above ground[2]	On front-cupped trees		On back-cupped trees		Total	
Inches	Number[3]	Percent	Number[3]	Percent	Number[3]	Percent
Under 7.0[4]	-	-	-	-	-	-
7.0- 8.9	855	28.7	252	14.6	1,107	23.5
9.0-10.9	995	33.3	588	34.0	1,583	33.6
11.0-12.9	698	23.4	507	29.3	1,205	25.6
13.0-14.9	278	9.3	198	11.5	476	10.1
15.0-16.9	107	3.6	107	6.2	214	4.5
17.0-18.9	24	.8	52	3.0	76	1.6
19.0 and larger	26	.9	25	1.4	51	1.1
Total	2,983	100.0	1,729	100.0	4,712	
Percent of total	63.3		36.7			100.0

[1]Does not include Ocala National Forest.

[2]Corrected to remove the influence of turpentining on tree diameter; calculated from diameters measured at 10 feet above ground.

[3]To convert to full number of cups add "000".

[4]The number of cups on trees under 7.0 inches in diameter is negligible.

Gum naval-stores production 1933-34

No data on the number of naval-stores operations or on the naval-stores croppage and production figures for the season 1933-34 were obtained directly on the line-plot survey. The gum naval-stores croppage and production figures given in Table 8 were obtained from a canvass of practically all of the operators in the unit. In many cases it was possible to confirm the production data by sales records and factors accounts. It has not been possible to check the 1933-34 croppage figures furnished by the operators. Accordingly, the data on average production per crop in naval-stores units for 1933-34 cannot be verified by the Survey. They are presented here for what they may be worth. To many persons they will appear unusually high. This large number of units per crop may possibly be explained by the availability of cheap labor and the favorable weather conditions which made possible the chipping of an abnormally large number of streaks during the 1933-34 season.

Table 8. - Naval-stores croppage and production classified by the types of operations that produced the crude gum, Survey Unit #1[1], Florida, season 1933-34

Types of operations	Number of operations	Thousands of working cups[2]	Production in naval-stores units[3]	Average production per crop in naval-stores units[4]
Operator	160	17,936	76,620	42.7
Operator and farmer	5	318	1,180	37.1
Operator and gum-buyer	1	50	190	38.0
Operator and custom-stiller	7	434	1,750	40.3
Operator, gum-buyer and custom-stiller	2	123	510	41.5
Gum-producer-seller	20[5]	60[5]	220[5]	36.7
Gum-producer-shipper	8[5]	371[5]	1,500[5]	40.4
Total	203	19,292	81,970	42.5

[1] Does not include Ocala National Forest.
[2] To convert to full number of cups add "000".
[3] Totals rounded to nearest ten units for each class of operation.
[4] A naval-stores unit is made up of a fifty-gallon barrel of turpentine and 3-1/3 500-pound (gross) barrels of rosin.
[5] Estimated from information furnished by still operators.

A word about the nation-wide Forest Survey

The Southern Forest Survey has been under way since January 1931. It is a part of the organization established by the United States Forest Service for the purpose of making a survey of the timber resources of the United States. The five-fold object of this nation-wide survey is: (1) to make an inventory of the present supply of timber and other forest products, (2) to ascertain the rate at which this supply is being increased through growth, (3) to determine the rate at which this supply is being diminished through industrial and local use, windfall, fire, and disease, (4) to determine the present requirement and the probable future trend in the requirement for timber and other forest products, and (5) to correlate these findings with existing and anticipated economic conditions in order that policies can be formulated for the effective use of land suitable for forest producton.

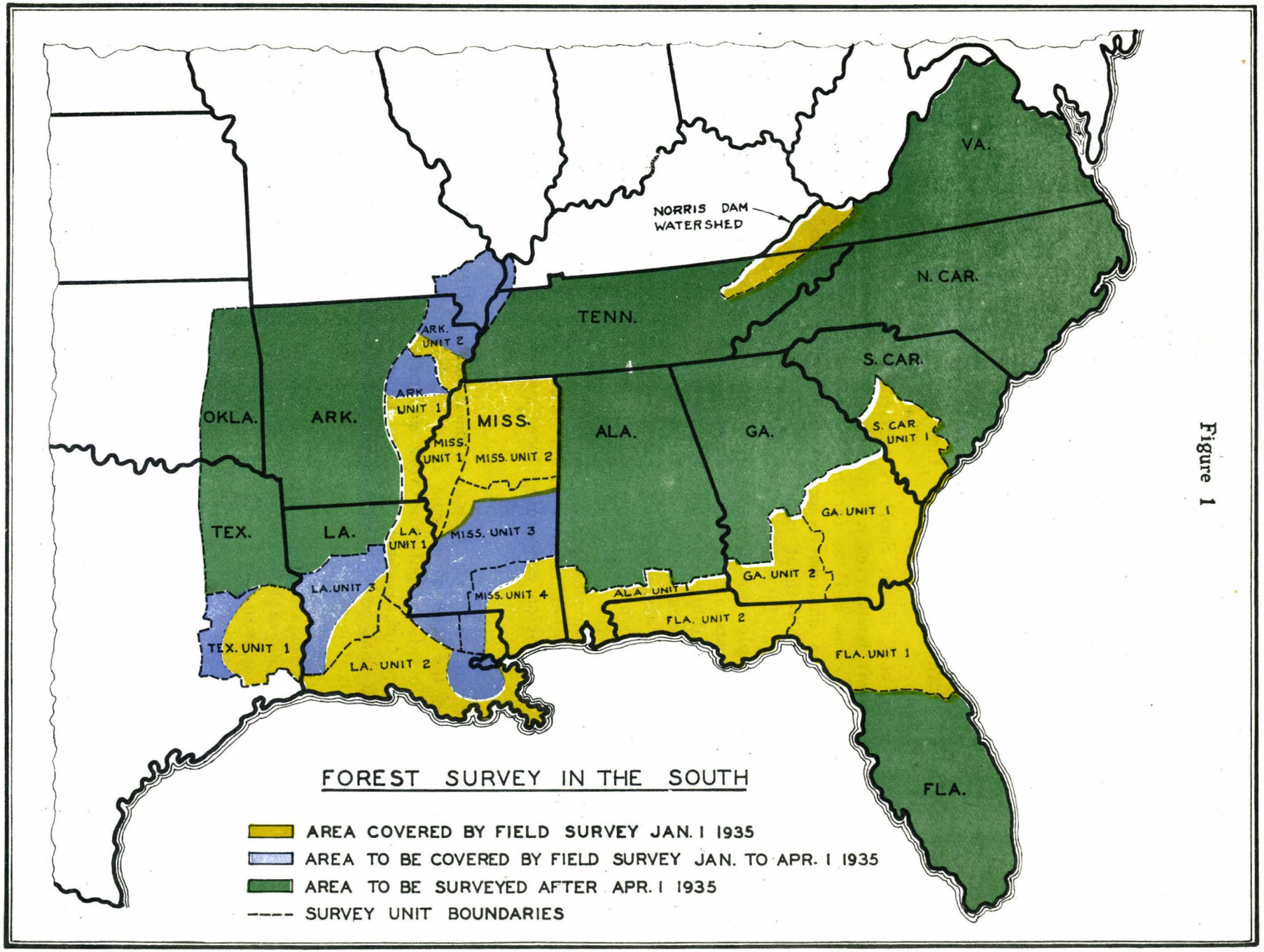
The Survey work in the South is carried on in geographic units of four to ten million acres. Unit boundaries are so established within a given state that the timber stand conditions, as well as factors governing the social, economic, and industrial activities are as uniform as possible throughout the unit. The land area within a unit is gridironed without regard to ownership or occupancy. Quarter-acre sample plots are laid out at intervals of 660 feet on parallel compass lines ten miles apart. On each sample plot the trees are counted and measured, and are classified by diameter classes and species groups. Growth rates of individual tree species, cull percentages, merchantable lengths, and other special data are obtained on randomly selected sample trees located on the sample plots. Forest growth and forest utilization specialists are assigned to forest growth and utilization studies in each of the survey units. In the naval stores region of the South Atlantic and Gulf Coast States, a special study of the gum naval stores industry has been made to determine, for each survey unit, the annual production of gum turpentine and gum rosin, the number of producers, and other related data not heretofore available. In addition, pertinent economic information concerning local woodusing industries is gathered in each survey unit.

A group of nineteen statistical experts and skilled computers is summarizing and analyzing the tremendous mass of field data gathered in each survey unit by the field crews. In this computation work modern electric sorting and tabulating machines and many other timesaving devices are being effectively used. In the analysis of the field data that have already been gathered by the Survey, it is estimated that more than half a million tabulating machine cards will be used.

As soon as analysis of the survey data is completed for any unit, a comprehensive statistical report will be prepared. This report will give essential information on the volume, growth, and present drain of the timber resource, and in the naval-stores belt will furnish data on naval-stores croppage and production.

On the following map is shown the status of the field work of the Survey on January 1, 1935.

The Forest Survey in the South is an activity of the Southern Forest Experiment Station of the United States Forest Service. Further information concerning the Survey can be obtained by writing to the Director, Southern Forest Experiment Station, 600 Stern Building, 348 Baronne Street, New Orleans, La.


VA.
NORRIS DAM WATERSHED
N. CAR.
TENN.
S. CAR.
ARK. UNIT 2
ARK. UNIT 1
OKLA.
ARK.
MISS.
MISS. UNIT 1
MISS. UNIT 2
ALA.
GA.
S. CAR. UNIT 1
TEX.
LA.
LA. UNIT 1
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MISS. UNIT 4
GA. UNIT 2
ALA. UNIT 1
FLA. UNIT 2
TEX. UNIT 1
LA. UNIT 2
FLA. UNIT 1
FLA.
FOREST SURVEY IN THE SOUTH
AREA COVERED BY FIELD SURVEY JAN. 1 1935
AREA TO BE COVERED BY FIELD SURVEY JAN. TO APR. 1 1935
AREA TO BE SURVEYED AFTER APR. 1 1935
SURVEY UNIT BOUNDARIES

Figure 1